

Recovery Plan Action Status

Plan Name: Recovery Plan for the Pacific Pocket Mouse (*Perognathus longimembris pacificus*)

Plan Status: Final

Plan Date: 28-Sep-98

Lead Agency: USFWS

Lead Office: Carlsbad Fish And Wildlife Office

(431-9440)

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Pacific pocket mouse (<i>Perognathus longimembris pacificus</i>)	1	1.1	Protect and secure extant populations	Partially Complete	FY 1995 - FY 1999		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, California Department of Fish and Game, Center for National Lands Management	Acquisition: General, Management: General, Other: Regulations	Internal Technical Assistance	
Pacific pocket mouse (<i>Perognathus longimembris pacificus</i>)	1	1.2	Undertake surveys to locate unknown populations	Ongoing Current	Prior to FY 1995		California Department of Parks and Recreation, Los Angeles International Airport, Nature Reserve of Orange County, Transportation Corridor Agencies (Orange County Toll Roads), Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game	Research: Habitat Status, Research: Population Surveys	Contract, Graduate Student, Internal Field Assistance, Internal Technical Assistance, Species Expert	In 2011, CDFG funded a local assistance grant to perform scent dog surveys and follow-up confirmatory trapping for PPM in the San Joaquin Hills of Orange County. Scent dog surveys performed in June of 2011 identified several prospective PPM populations. Confirmation trapping was performed at one site in July of 2011 with additional trapping surveys proposed in 2012.
Pacific pocket mouse (<i>Perognathus longimembris pacificus</i>)	1	1.3	Continue to refine a standardized survey approach	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service	Research: Population Surveys	Contract, Graduate Student, Internal Field Assistance, Internal Technical Assistance, Species Expert	USGS has been contracted by MCBP to develop a long term monitoring program. CFWO continues to work internally and with consultants to identify a preferred strategy for assessing presence of the species.

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Pacific pocket mouse (Perognathus longimembris pacificus)	1	1.4	Identify prospective habitat and population sites	Ongoing Current	FY 2000 - FY 2004		California Department of Parks and Recreation, Los Angeles International Airport, Nature Reserve of Orange County, Transportation Corridor Agencies (Orange County Toll Roads), Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game	Research: Habitat Requirements, Research: Population Surveys	Contract, Internal Field Assistance, Internal Technical Assistance, Species Expert	In 2011 a habitat model was applied to the San Joaquin Hills to focus search areas for a scent dog survey. Scent dog surveys were then performed across much of the habitat modeled as having high and very high habitat suitability, with the dog/handler/biologist survey team identifying several areas that may be capable of supporting PPM. Follow up habitat assessments and confirmation surveys are planned for 2012.
Pacific pocket mouse (Perognathus longimembris pacificus)	1	1.5	Identify essential habitats and sites	Ongoing Not Current	Prior to FY 1995		U.S. Fish and Wildlife Service	Management: Land Use, Management: Planning	Internal Technical Assistance	
Pacific pocket mouse (Perognathus longimembris pacificus)	1	1.6	Evaluate and prioritize protection alternatives for essential habitat	Not Started	FY 1995 - FY 1999		U.S. Fish and Wildlife Service	Management: Planning	Internal Technical Assistance	Extent of essential habitat and possible costs presently unknown
Pacific pocket mouse (Perognathus longimembris pacificus)	1	1.7	Protect essential habitat	Not Started	FY 1995 - FY 1999		California Department of Parks and Recreation, Nature Reserve of Orange County, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, California Department of Fish and Game, U.S. Army Corps of Engineers, Center for National Lands Management, City of Dana Point, California Coastal Commission	Management: General, Management: Land Use, Other: Regulations	Internal Technical Assistance	Extent of essential habitat and possible costs presently unknown

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Pacific pocket mouse (Perognathus longimembris pacificus)	1	2.1	Monitor population trends and identify potential threats and management needs	Ongoing Not Current	Prior to FY 1995		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, Center for National Lands Management	Research: Competition, Research: Demographic Studies, Research: Genetics, Research: Habitat Requirements, Research: Habitat Status, Research: Population Surveys, Research: Predation	Contract, Graduate Student, Internal Field Assistance, Internal Technical Assistance, Species Expert	Monitoring program for MCBCP under development with pilot studies underway. Monitoring performed at Dana Point in 2011.
Pacific pocket mouse (Perognathus longimembris pacificus)	1	2.2.1	Develop and implement adaptive management plan for Camp Pendleton	Ongoing Current	FY 2011		Camp Pendleton, U.S. Marine Corps	Work type not yet selected	Labor type not yet selected	MCB Camp Pendleton initiated development of adaptive management plan in Winter of 2011.
Pacific pocket mouse (Perognathus longimembris pacificus)	1	2.2.2	Develop and implement adaptive management plans for other locales	Complete	FY 2005	FY 2005	Center for National Lands Management	Management: General, Research: Management Techniques	Contract, Internal Field Assistance, Internal Technical Assistance	AMP for Dana Point completed and being implemented by the Center for Natural Lands Management with continued coordination with USFWS

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Pacific pocket mouse (Perognathus longimembris pacificus)	1	2.3	Protect habitat from fire and fire abatement measures	Not Started			California Department of Parks and Recreation, Cornell University, International Institute of Biological Control, Los Angeles International Airport, Nature Reserve of Orange County, Orange County Environmental Management Agency, Transportation Corridor Agencies (Orange County Toll Roads), U.S. Department of Agriculture, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, U.S. Army Corps of Engineers	Management: Habitat Maintenance and Manipulation	Labor type not yet selected	Internal Field Assistance, Internal Technical Assistance
Pacific pocket mouse (Perognathus longimembris pacificus)	1	2.4	Fence Pacific pocket mouse habitat where necessary	Ongoing Not Current	FY 1995 - FY 1999		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Center for National Lands Management, City of Dana Point	Management: General	Contract	Fencing has been implemented at Dana Point but more work is needed at San Mateo North to restrict access to adjoining homeowners.
Pacific pocket mouse (Perognathus longimembris pacificus)	1	2.5	Control depredation by cats and other exotic predators	Ongoing Not Current	FY 2009		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, Southwest Division, U.S. Navy, California Department of Fish and Game, Center for National Lands Management, City of Dana Point	Work type not yet selected	Labor type not yet selected	Center of Natural Lands Management is monitoring predators and removing feral cats at Dana Point. More work is needed since no monitoring or management of predator populations is being implemented elsewhere.

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Pacific pocket mouse (Perognathus longimembris pacificus)	2	2.6	Control exotic plants	Ongoing Not Current	FY 1995 - FY 1999		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, Center for National Lands Management, Headlands Reserve, LLC.	Management: Habitat Maintenance and Manipulation	Contract, Internal Field Assistance, Internal Technical Assistance	Exotic plants being controlled at Dana Point and on intermittent basis by State Parks at San Mateo North. No exotic plant control is currently being performed elsewhere on Camp Pendleton.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	2.7	Monitor success of management efforts	Ongoing Current	FY 1995 - FY 1999		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, Center for National Lands Management	Management: Habitat Maintenance and Manipulation, Research: Habitat Status, Research: Management Techniques	Contract, Internal Field Assistance, Internal Technical Assistance	Center of Natural Lands Management has performed habitat management and is monitoring PPM population at Dana Point. State Parks is performing habitat enhancement experiment and follow up monitoring of PPM population at San Mateo North.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	3.1	Select target sites for actions that enhance or expand habitat	Ongoing Current	Prior to FY 1995		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, Center for National Lands Management, Headlands Reserve, LLC.	Management: Habitat Maintenance and Manipulation, Research: Habitat Requirements, Research: Habitat Status	Contract, Internal Field Assistance, Internal Technical Assistance	Habitat enhancement efforts currently being pursued at San Mateo North and Dana Point. Efforts to enhance habitat adjoining Oscar One have lapsed and more work is needed to identify enhancement opportunities adjoining Santa Margarita and San Mateo South populations.

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Pacific pocket mouse (Perognathus longimembris pacificus)	2	3.2	Undertake habitat manipulations to increase population numbers	Ongoing Current	FY 1995 - FY 1999		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, Center for National Lands Management, Headlands Reserve, LLC.	Management: Habitat Maintenance and Manipulation	Contract, Internal Field Assistance, Internal Technical Assistance, Species Expert	Habitat enhancement currently being implemented adjacent to area of historical occupancy at Dana Point. In 2009 a \$46,000 Preventing Extinction Grant was awarded for habitat enhancement at San Mateo North. Initial vegetation thinning was performed to enhance habitat at this locale in 2010 with \$18,500 remaining for follow up studies and enhancement (e.g. weed control) efforts.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	3.3	Adaptively manage Pacific pocket mouse habitat and populations	Ongoing Not Current	FY 1995 - FY 1999		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, Center for National Lands Management, Headlands Reserve, LLC.	Management: Habitat Maintenance and Manipulation, Management: Reintroduction, Research: Competition, Research: Demographic Studies, Research: Habitat Requirements, Research: Habitat Status, Research: Management Techniques, Research: Population Surveys, Research: Predation, Research: Propagation, Research: Reintroduction	Contract, Internal Field Assistance, Internal Technical Assistance, Species Expert	Center for Natural Lands Management is adaptively managing the Dana Point PPM population. CDPR has performed an enhancement experiment at San Mateo North with follow up study planned. An adaptive management plan has yet to be adopted for Camp Pendleton though an AMP is now under development.

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Pacific pocket mouse (Perognathus longimembris pacificus)	2	3.4	Undertake habitat manipulations for reintroduction efforts	Ongoing Not Current			Los Angeles International Airport, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game	Management: Reintroduction	Contract, Graduate Student, Internal Field Assistance, Species Expert, Volunteer	Small habitat manipulation performed at Oscar One in 2009 but additional work is likely needed at this location in advance of a reintroduction.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	3.5	Evaluate and monitor success of habitat restoration efforts	Ongoing Current	FY 1995 - FY 1999		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, California Department of Fish and Game, Center for National Lands Management, Headlands Reserve, LLC.	Management: Population Monitoring	Contract, Graduate Student, Internal Field Assistance, Species Expert	CDPR performed habitat enhancement experiment and follow up monitoring in 2010. Around \$18,500 remains to support continued implementation of this effort. Center for Natural Lands Management has been performing follow up monitoring in areas of habitat enhancement at Dana Point.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.1	Collect basic information on natural history	Ongoing Current	FY 1995 - FY 1999		Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, Center for National Lands Management, Headlands Reserve, LLC.	Management: Planning	Graduate Student, Internal Field Assistance, Internal Technical Assistance, Species Expert	Pilot monitoring at MCB Camp Pendleton proposes to use tracking tubes to better delineate period of activity for PPM.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.10	Refine management plans	Not Started			California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game	Work type not yet selected	Labor type not yet selected	

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Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.11	Refine recovery criteria	Not Started			U.S. Fish and Wildlife Service	Other: Administration	Internal Technical Assistance, Species Expert	
Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.2	Research predator ecology	Ongoing Not Current			California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game	Research: Predation	Contract, Graduate Student, Internal Field Assistance	CNLM performing camera trapping and studying mesopredator population at Dana Point. More work needed at other populations.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.3	Evaluate argentine ant invasions into existing and potential habitat	Ongoing Current			California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, Center for National Lands Management	Research: Ecosystem Studies	Contract, Graduate Student, Internal Field Assistance	USGS assessing Argentine ants during population monitoring program development. CDPR collaborating with USGS at San Mateo North.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.4	Evaluate role of fire and fire management	Ongoing Not Current	FY 2000 - FY 2004		California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, Center for National Lands Management	Management: Habitat Maintenance and Manipulation, Management: Land Use, Research: Competition, Research: Habitat Requirements, Research: Habitat Status, Research: Management Techniques	Contract, Graduate Student, Internal Field Assistance, Internal Technical Assistance, Species Expert	Potential additional costs TBD
Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.5	Evaluate effects of night time lighting	Not Started			California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game	Research: Habitat Requirements	Contract, Graduate Student, Internal Field Assistance, Species Expert	

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Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.6	Evaluate effects of past agriculture on habitat function	Not Started			California Department of Parks and Recreation, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game	Research: Ecosystem Studies	Contract, Graduate Student, Internal Field Assistance, Species Expert	
Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.7	Develop biocontrol methods for exotic plant species	Not Started			Cornell University, U.S. Department of Agriculture, U.S. Fish and Wildlife Service	Research: Management Techniques	Contract, Graduate Student, Internal Field Assistance, Species Expert	Potential additional cost TBD
Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.8.1	Determine reproductive potential of the subspecies	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Demographic Studies, Research: Other Information	Graduate Student, Internal Field Assistance, Internal Technical Assistance, Species Expert	
Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.8.2	Determine habitat area requirements and dispersal distances	Ongoing Not Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Demographic Studies, Research: Habitat Requirements, Research: Migration	Contract, Graduate Student, Internal Field Assistance, Internal Technical Assistance, Species Expert	
Pacific pocket mouse (Perognathus longimembris pacificus)	2	4.9	Conduct research on conservation genetics	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service	Research: Genetics	Contract, Graduate Student, Internal Field Assistance, Species Expert	San Diego Zoological Society is conducting research on the genetic variability within and between populations
Pacific pocket mouse (Perognathus longimembris pacificus)	2	5.1	Evaluate feasibility of carrying out translocation efforts	Ongoing Current	FY 1995 - FY 1999		Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game	Research: Propagation, Research: Reintroduction	Graduate Student, Internal Field Assistance, Internal Technical Assistance, Species Expert	Institute for Conservation Research/San Diego Zoological Society is researching behaviors associated with habitat preference and flight response to translocation. Additional studies are contemplated in association with \$344,500 Section 6 Grant awarded in 2011 to establish a captive population of PPM.

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Pacific pocket mouse (Perognathus longimembris pacificus)	2	5.2	Develop a translocation protocol for wild-reared and captive-bred individuals	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Reintroduction	Internal Technical Assistance, Species Expert	San Diego Zoological Society has prepared an experimental protocol to be implemented at time of reintroduction of captive bred animals.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	5.3	Implement a translocation program	Not Started			California Department of Parks and Recreation, Los Angeles International Airport, Transportation Corridor Agencies (Orange County Toll Roads), Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game	Management: Reintroduction	Contract, Graduate Student, Internal Field Assistance, Species Expert	To be undertaken only if feasible and necessary (as determined by prescribed research); possible future costs TBD
Pacific pocket mouse (Perognathus longimembris pacificus)	2	5.4	Monitor translocated populations	Not Started			California Department of Parks and Recreation, Los Angeles International Airport, Transportation Corridor Agencies (Orange County Toll Roads), Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game	Management: Population Monitoring	Contract, Graduate Student, Internal Field Assistance, Species Expert	

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Pacific pocket mouse (Perognathus longimembris pacificus)	2	5.5	Develop a protocol for captive breeding (if necessary)	Ongoing Current			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Propagation	Contract, Graduate Student, Internal Field Assistance, Species Expert	Institute for Conservation Research/ San Diego Zoological Society has prepared a draft captive breeding protocol and determined facility needs, and likely start up expenses.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	5.6	Implement a captive breeding program for a related species	Not Started			Transportation Corridor Agencies (Orange County Toll Roads), U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Propagation	Contract, Graduate Student, Internal Field Assistance, Species Expert	Adequate numbers of PPM are now known to exist to justify proceeding directly with captive breeding of PPM using methods worked out for other Heteromyiids.
Pacific pocket mouse (Perognathus longimembris pacificus)	2	5.7	Implement a captive breeding program for Pacific pocket mouse	Not Started			Transportation Corridor Agencies (Orange County Toll Roads), U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Propagation	Contract, Graduate Student, Internal Field Assistance, Species Expert	2011 Section 6 Grant of \$344,500 awarded to initiate captive breeding of PPM in 2011/2012 timeframe.

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Pacific pocket mouse (Perognathus longimembris pacificus)	2	6.1	Develop participation plans to implement recovery	Not Started			California Department of Parks and Recreation, Cornell University, International Institute of Biological Control, Los Angeles International Airport, Nature Reserve of Orange County, Orange County Environmental Management Agency, Transportation Corridor Agencies (Orange County Toll Roads), U.S. Department of Agriculture, Camp Pendleton, U.S. Marine Corps, U.S. Fish and Wildlife Service, Southwest Division, U.S. Navy, California Department of Fish and Game, U.S. Army Corps of Engineers	Management: Planning, Other: Information and Education	Contract, Internal Technical Assistance	
Pacific pocket mouse (Perognathus longimembris pacificus)	2	6.2	Distribute information on recovery plan actions and results	Not Started			U.S. Fish and Wildlife Service	Other: Information and Education	Internal Technical Assistance	
Pacific pocket mouse (Perognathus longimembris pacificus)	2	6.3	Integrate implementation of recovery plan with local agencies, including NCCP	Not Started			U.S. Fish and Wildlife Service	Management: Planning	Internal Technical Assistance	